Why Do Pay Elasticity Estimates Differ?

September 5, 2016

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Motivation

- The measured relationship between pay and reenlistment has changed over time
  - Pay elasticity = percent increase in reenlistment due to 1% increase in pay
  - SRB effect
- Navy planners use these estimates to predict reenlistment, determine allocation of SRB $$, etc.
- WHY do estimates vary?

Why Do We Care?

- Size of pay elasticity is important to policymakers for predicting reenlistment
  - With reenlistment rate of 43 percent (FY00) and a 6 percent increase in basic pay
    - Pay elasticity of 1.0 => reenlistment rate of 46 percent
    - Pay elasticity of 3.0 => reenlistment rate of 51 percent
    - Higher elasticity implies more than 900 additional reenlistments

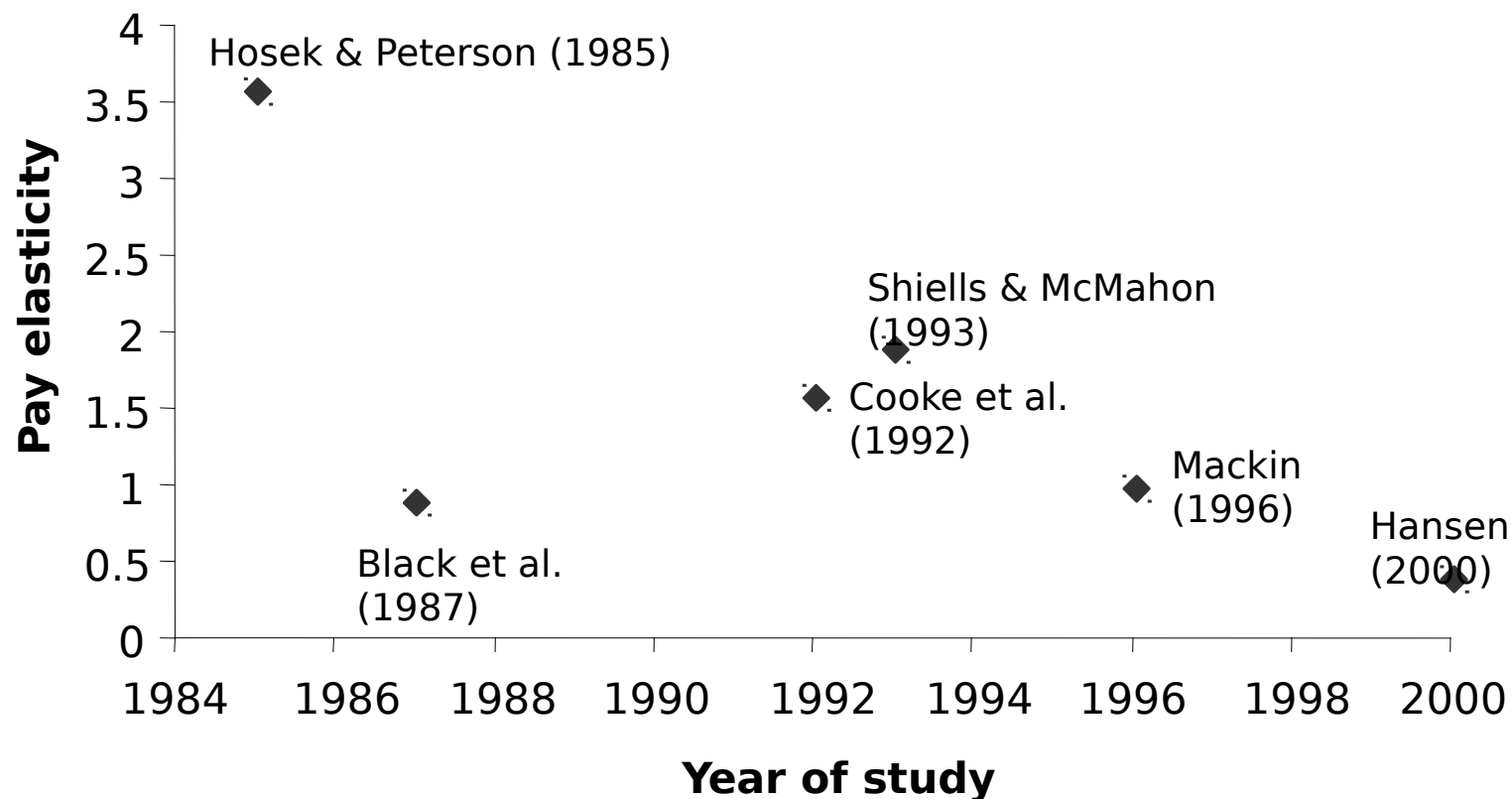# Costs of Reenlistment Depend Heavily on Elasticity

- Example: Aviation Electronics Technicians (AT)
  - Current SRB level = 3.0
  - Current reenlistment = 36 percent
  - With target reenlistment rate of 42 percent,

If SRB elasticity is	Required SRB level	Cost of reaching target	
2.0 p.p.	6.0	~ $7.4m	40% difference
3.0	5.0	~ $5.3m	

How Do Pay Elasticites Vary Across Studies?

Why Do Estimates Differ?

1. Researchers
   - Different analytical approaches
2. Sailors
   - "True" change in responsiveness to pay over time

Researchers Make Fundamental Decisions on:

- Pay
  - Basic pay, RMC, current pay, future compensation, civilian earnings, etc...
- Reenlistment
  - Eligibility, treatment of extensions, etc...
- Methodology
  - Level of aggregation, model specification, etc...
- In most cases, there is no obvious "right" answer

Our Approach

- We use FY87 to FY99 data and a *variety* of methodologies
  - Each methodology yields its own pay elasticity
- We estimate separate elasticities for each fiscal year using a *single* (common) methodology
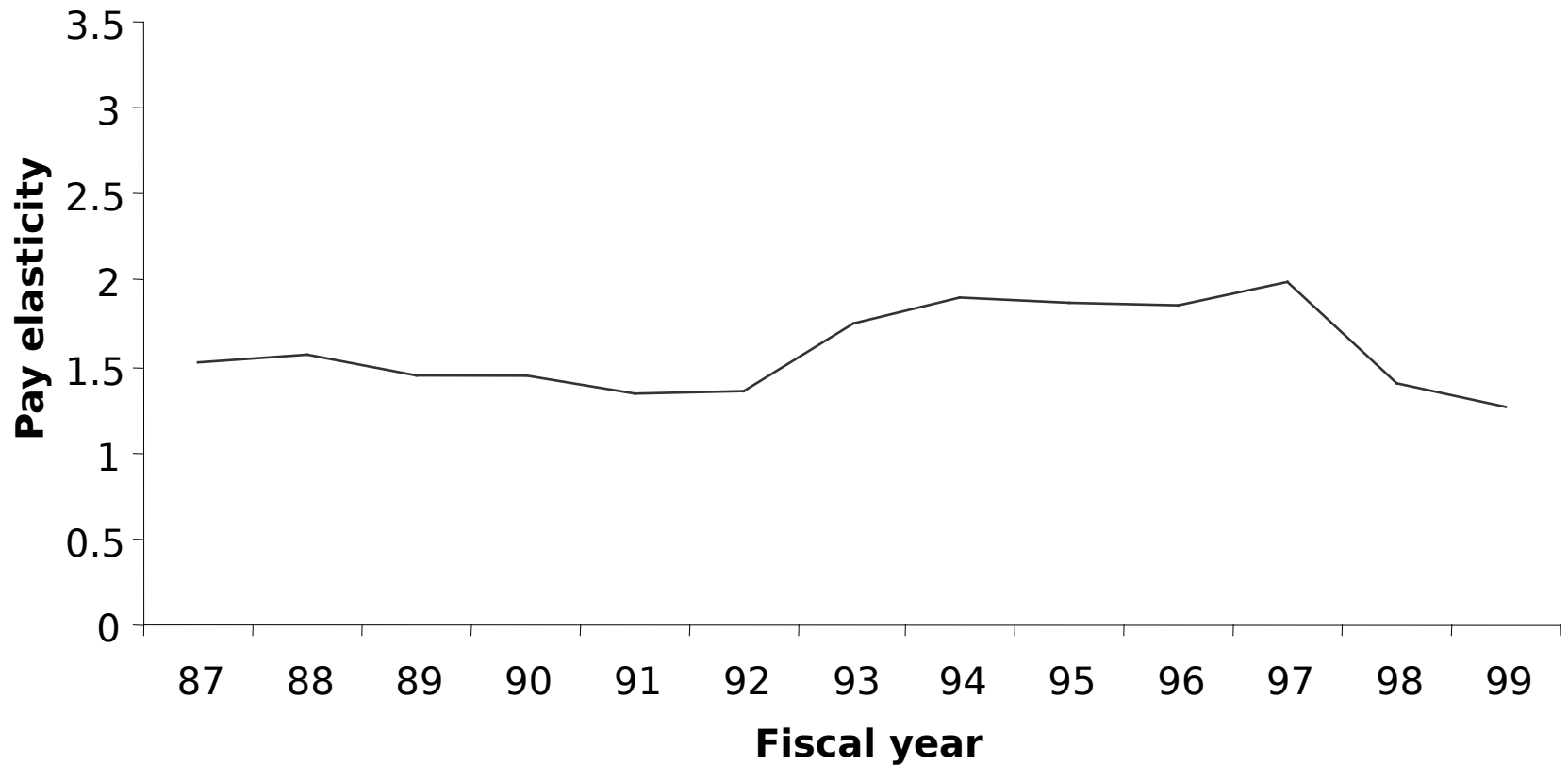
Estimates Depend Heavily on Choice of Methodology

- "Baseline" model results:
  - Pay elasticity : 1.5

- HOWEVER, by changing assumptions:
  - Pay elasticities ranging from 0.4 to 2.9
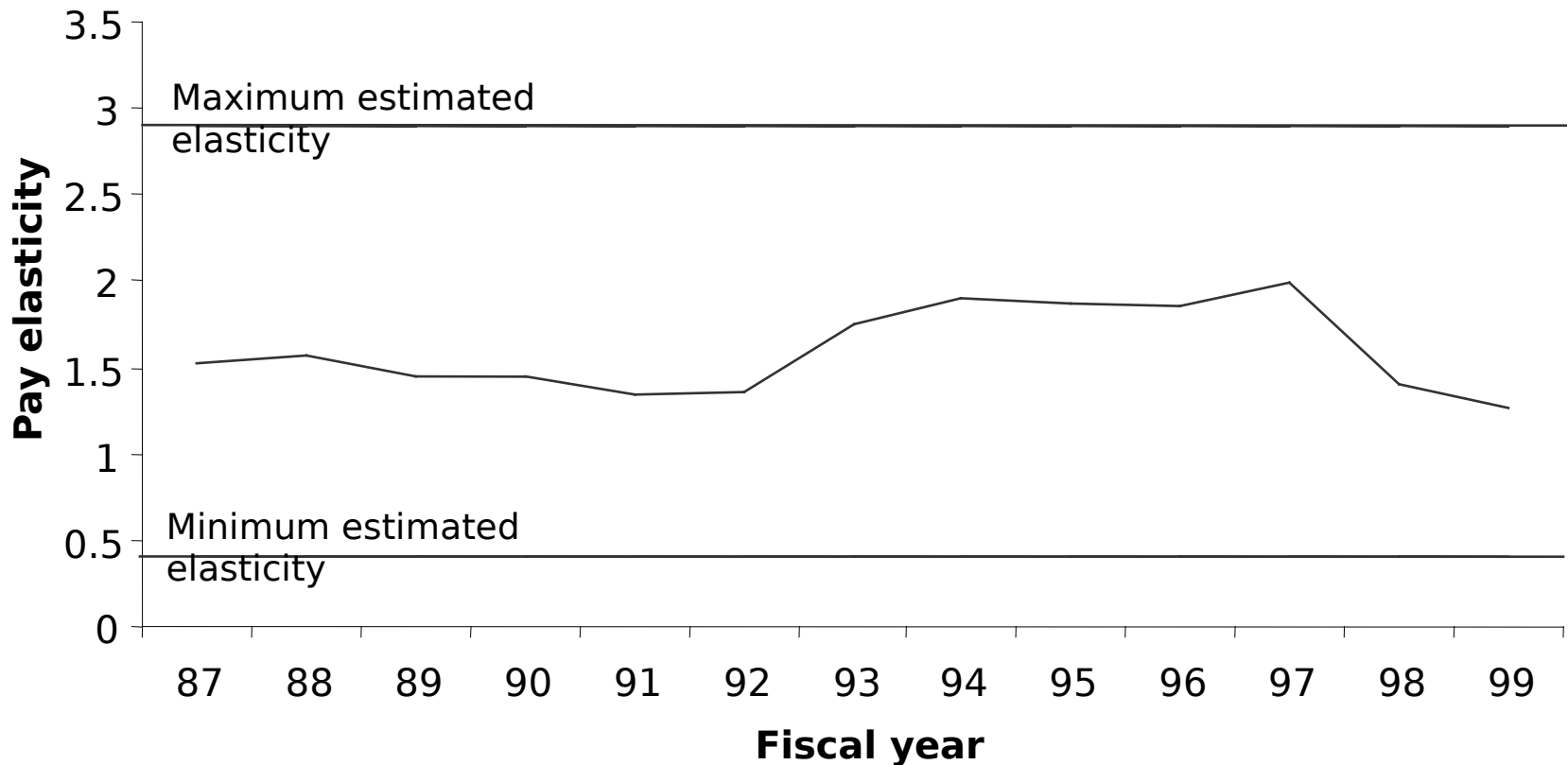 - Variation matches range found in previous literature

If the Data Don't Change, How Can the Pay Elasticity Change?

- Alternative specifications *describe* the same behavior, but

  – They differ in how much of that behavior they *attribute* to pay

- Measured "importance" of pay is highly sensitive to assumptions

Differences Over Time are Small

Chart: Pay elasticity vs. Fiscal year. Y-axis "Pay elasticity" ranges from 0 to 3.5. X-axis "Fiscal year" from 87 to 99. Line starts around 1.53 in 87, rises slightly to 1.58 in 88, declines to about 1.35 in 91-92, rises to about 1.9 in 94, peaks near 2.0 in 97, then drops to about 1.28 in 99.

Differences Over Time are Small

Different methodologies yield elasticities throughout this range

How Well Do Different Approaches Predict Reenlistment Behavior?

- Approaches differ in their ability to accurately predict reenlistment rates
  - Aggregate reenlistment and reenlistment in critical ratings
  - (Actual - Predicted) range: 1-20%
- "Baseline" model consistently performs best
  - Predictions are within 2 percent of actual reenlistment rates

Implications

- Different methodologies are responsible for most of the differences in estimates

- Sailors have changed, but their response to pay has not

Questions?